State of California — Department of Health

Memorandum

To : Ephraim Kahn, M.D.

Date : March 20, 1974

Subject: EPA "Worker Protection Standards for Agricultural Pesticides"

From : Henry Anderson

Personal & confidential

This memorandum is intended to be read in conjunction with, but following, mine of March 15, 1974. In that earlier memo, I commented upon the rationale lying behind EPA's new standards -- particularly as reflected in the Agency's summary of the 13 hearings which it conducted and the 4 which were conducted by the Department of Labor during 1973. I shall attempt, here, to avoid repetition of the points made in my previous memo, except in such cases as it seems to me a point is so crucial that it bears repeating. The following comments derive directly from the material which appears in the Federal Register, Vol. 39, No. 48, Monday, March 11, 1974, pp. 9457-9462.

1. Beginning with the very first sentence, and continuing throughout the section entitled "Background Information and Basis for the Proposed Standards," EPA is at great pains to argue that post-application hazards have always been taken into account during the registration process; that "harvest entry standards" for the protection of workers have been on the labels of "many pesticide products" for "many years"; etc. This is a curious claim. If, in fact, the Agency, and before it the U.S. Department of Agriculture, had given any serious attention to post-application risks, and this concern had been translated into label requirements, there would be no need for the

Uphill testimony before Senate Committee, etc.

new standards. One searches in vain throughout this material for any suggestion that there is a problem not already being met, much less for evidence to support such a suggestion.

One can only assume that EPA knows there is an unmet problem -- else why go to all this trouble? -- but is trying to avoid the trap into which OSHA fell on May 1, 1973, when it claimed there was a "grave danger" and quoted some unsupported morbidity and mortality data. That claim, more than anything else, gave industry the excuse it was looking for to obtain a court order striking down the entire OSHA standard. EPA was no doubt well advised to avoid that mistake.

But that still leaves the question of why the Agency swung so far in the opposite direction, and argues, in so many words, that the new standards don't require anything that hasn't been required for "many years." One can only assume this was intended to disarm industry complaints of impracticability. If manufacturers and growers have been doing all these things all along, they can't very well complain now, can they? Or can they? The Agency's strategy is clever, but not without pitfalls of its own. One can visualize industry going into court again, and arguing, this time, that the Agency has as much as conceded the regulation is redundant and superfluous; it should therefore be enjoined as a waste of taxpayers' money, etc., etc.

EPA may live to regret its inclusion of the opening section on "Background Information and Basis for the Proposed Standards."

2. The second section is entitled "The July 31, 1973 Federal Register Notice." In this section, the following claims are made:

> ...issues and proposal(s) were framed in a manner such as to stimulate controversy rather than complacency. ... Hearings at 13 locations... have been completed in an attempt to obtain as much meaningful information as possible to permit sound determinations on these and other issues. ... Now that additional and extensive evidence is available from the hearings and written comments, EPA believes itself to be in a position to propose standards reflecting new information.

These self-congratulatory claims are untrue. The truth is that the hearings were conducted without any attempt at all to obtain "meaningful information. To an overwhelming degree, they were a dreary parade of self-serving opinions offered by extension agents, Farm Bureau types, and other spokesmen for the agri-industrial complex. No effort was ever made to get these witnesses to support their opinions by evidence of any meaningful type. On the other hand, those few witnesses who did attempt to get scientific information into the record were bedevilled and discredited by an attorney representing the agri-industrial complex.

It would seem that a child could grasp the fact that the most "meaningful information" bearing on the issue of worker reentry consists of the results from the half-dozen worker reentry studies conducted to date. As I pointed out in my March 15, 1974, memorandum, far from basing its determinations on this information, EPA studiously ignored it. For reasons known only to itself, the Agency is not content with that glaring error of omission, but now compounds it with sanctimonious and demonstrable false claims that its proposed standards are based on all the available evidence. Quite the antithesis: they are based on no evidence.

3. The third section is entitled "Summary of Findings Based on the Hearing Record." This section opens with the curious statement that evidence was submitted "in order of the volume of testimony by representatives of state regulatory, research and extension agencies, growers and grower organizations, pesticide manufacturers and manufacturer organizations, the academic community, field workers and public interest groups." (Emphasis added.)

In the first place, EPA's preoccupation with "volume of testimony" (and, in its earlier document, on which I commented in my last memo, its preoccupation with sheer number of witnesses) places the emphasis squarely where it does not belong: on quantity rather than quality of testimony. Suppose Cesar Chavez had read the entire Encyclopedia Brittanica into the hearing record. That would have outweighed the volume of all other testimony. Would EPA have felt compelled, then, to incorporate Chavez's opinions into regulations?

But there is something else wrong with EPA's listing of types of witnesses "in order..." The listing makes it appear that most testimony was submitted by representatives of state agencies. The unwary reader will naturally assume that these witnesses were highly responsible, objective, knowledgeable, even scholarly types, whose testimony was of a higher quality than that of the other witnesses listed. A few spokesmen for state agencies did, in fact, give testimony of a high caliber, based solely on scientific data, and devoid of special pleading -- unless it were pleading for the primacy of human health and safety.

But most representatives of state agencies did not testify in this vein. It is preposterous to lump a Dr. Maddy or a Dr. Kahn with an agricultural extension agent whose sole contribution was to parrot the industry line. The

only useful classification of witnesses -- if they must be classified at all -- is between those who shed light on the scientific questions at issue, and those who shed nothing but heat.

It is beside the point whether a witness happens to agree or disagree with my conclusion that EPA's regulations offer grosslyinadequate protection. The point is how they arrive at their conclusion. A representative of a "public interest group" or farm workers union who offers only a diatribe is to be taken no more seriously than the grower who offers an equal and opposite diatribe.

I understand that a certain Dr. C.H.Van Middelem testified at OSHA's hearing in Atlanta, on August 15, 1973, in favor of generally shortened reentry intervals for Florida citrus -- particularly for a compound in which he seemed to have an interest, ethion. I disagree with his conclusions, but at least he offered a basis for discussion: some residue data which seemed to suggest that ethion degrades to something like 1/70 the California level in a comparable period of time. And this despite the fact there had been no rainfall during the Florida study.

Such testimony opens up the possibility of serious dialogue. What formulations were used in the two states? what dose rate? type and amount of diluent? how were leaves sampled, stripped, and analyzed? / how many times were oxygen analogs studied? was the experiment repeated? And then, of course, the big questions: what do residue levels of this order mean in terms of human physiological effect? And even if it can be proved conclusively that pesticide residues behave

radically differently in different parts of the country, is this fatal to the concept of a uniform national safety standard? If residues behave differently on foliage, they must also behave differently on fruit, and yet there is a single national standard for fruit tolerances and PHI's.

These are the kinds of considerations which can be debated, in a responsible manner, when both parties are operating on a basis of fact. It is a pity that no one from EPA or OSHA asked Dr. Van Middelem any of the foregoing questions. What seems to have happened is that the agencies embraced his conclusions, uncritically, because they conformed to conclusions which had already been reached, and the single national standard was set at the lowest possible denominator rather than the highest.

4. Under the section headed "Summary of Findings Based on the Hearing Record", the first and most important conclusion is as follows:

> The primary scientific basis for associating the persistence and toxicity of pesticide residues with potential injury to farmworkers is the evidence concerning reported experiences of growers, manufacturers, farm workers and unions and states.

This statement is enough to make one despair of the rationality and integrity of mankind. "Reported experiences" -- that is, incidents which come to official notice through existing mechanisms -- are the worst of all possible bases for judging potential hazard. I can do no better than to quote, here, a portion of the Task Group report which is currently circulating:

> The Task Group rejects the view that clinically apparent farm worker poisonings, which come to light through existing reporting systems, are the appropriate basis for judgments on the extent and severity of the pesticide residue problem, or for the construction of programs of

> control. ... The best available evidence indicates to us that existing reporting is misleading in two crucial respects: it does not reveal the dimensions of the iceberg beneath the surface; and the tip which protrudes is not necessarily representative of the whole. It is well known in the field of public health that differential incidence rates of childhood, venereal, and other reportable diseases bespeak the quality of reporting systems as well as true incidence. The fact that some parts of the country report relatively many OP poisonings, and other regions report relatively few may reflect actual incidence; but it may reflect nothing more than advanced detection programs in the former, and undeveloped programs in the latter.
>
> No matter how good the reporting of occupational illnesses may become, however, the Task Group does not believe that disease reporting systems are the best basis for deciding whether working conditions are acceptably safe. In other industries, physicians do not wait until workers suffer acute illnesses before recommending changes in the working environment. The Task Group believes that agricultural field workers are entitled to work in an environment which will not cause significant alterations in blood cholinesterase levels or any other physiological parameters.

These ringing affirmations may be found on pages 111-115 of the "final draft" of the Task Group report now being circulated. It remains to be seen how much of this report will actually be issued in the name of the full group. The chairman of the group is under heavy pressure -- primarily from the same Southeastern interests which brought most pressure upon OSHA and EPA -- to come in with a greatly truncated report, and one which accepts regional differences in poisoning reports as though they were all equally valid.

But this much may be said with assurance: the biostatistical and occupational safety philosophy embodied in the above quotation is held by some of the nation's most eminent authorities in this field, including the chairman of the Task Group. If EPA is unaware of this philosophy, it can be

charged with nothaving availed itself of the most authoritative available material. Copies of all Task Group dudumants are sent to EPA and OSHA representatives.

If, on the other hand, EPA was aware of the position of Dr. Milby and the rest of the steering committee which wrote the abovementioned document (Culver, Spear, Anderson), it can be charged with having set itself deliberately against this position. Who are the EPA experts in occupational health and medicine who dare to claim that the best "scientific basis" for setting standards for the protection of farm workers (or, for that matter, any other type of workers) is reports of actual poisonings? Let them come forward where they may be seen, and identified, and challenged by those who have real experience and competence in this field of expertise.

5. The second point in EPA's summary of the hearing record is:

> Most injuries and illnesses among farmworkers which are reported and which are recognized to be pesticides-related have resulted from substantial and prolonged contact with treated foliage and other plant surfaces in the production of tree fruits, grapes, tobacco, cotton and other crops.

An asxinine statement which says nothing because it says everything. What other kinds of contact are there than "with treated foliage and other plant surfaces?" What other kinds of crops are there than "tree fruits, grapes, tobacco, cotton, and other crops?"

6. The third point in EPA's hearing summary alleges that:

> The principal hand labor operations requiring contact with treated foliage and other plant surfaces include harvesting, fruit thinning, summer pruning, propping and placement of irrigation pipes.

This statement is even more remarkable for what it leaves out than for

what it includes. Some of the heaviest contact with treated foliage occurs in the course of pre-harvest grape culture: girdling, bunching, leaf-pulling, etc. Considerable contact occurs during the thinning, blocking, and weeding of row crops such as sugar beets, lettuce, cauliflower, etc.

It comes as news that only "summer pruning" involves contact with treated foliage. Is EPA under the impression that olives, citrus, etc., are deciduous? It comes as news, also, that the "propping and placement of irrigation pipes" deserves to be mentioned in the same breath as high-contact hand labor operations. Has anyone from EPA ever been into the field? To the extent that irrigation involves extensive contact with plant surfaces, it is not at the peripheries where pipes are "propped and placed", but in the interior of fields and orchards where irrigators must sometimes wade to clear out blockages which prevent ditches from carrying water all the way across to the other side.

Finally, it is an irrelevant and unnecessary clouding of the issue to state, as EPA states, that "'scouting' to determine the pest situation and the need for treatment may result in considerable contact with treated foliage." To quote again from the most authoritative available statement on the subject of occupational exposures, namely the Task Group report:

> (The) potential exposure (of 'scouts') is different in kind from that of workers who enter the premises later for the performance of weeding, picking, or other tasks. The 'scout' may be thought of as a sort of researcher (or researcher's assistant). He is under no assurances that his working environment is necessarily safe for the human organism; his job is to see if the environment is still unsafe for target organisms.
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> ...In a word, 'scouts' are a special case, and protecting them calls for special methods, different both from the strategies for protecting

spray applicators and also from those for protecting regular field laborers. Perhaps frequent medical monitoring is most appropriate to the special case of 'scouts.'

Since EPA's standard says not one word about medical monitoring, it is simply irresponsible to mention "scouts" at all, and to hold out the implication that this standard will somehow protect them.

7. The fifth point in EPA's summary of the hearing record:

Protective clothing requirements for impermeable garments proposed in the July 31 Notice are impractical under normal agricultural working conditions, including heat prostration...

An interesting piece of syntax. Is heat prostration xxx part of normal agricultural working conditions?

Seriously, this concern over what is practical and what is "impractical" represents a significant retreat from the July 31 standard in one major respect. That portion of the earlier standard which referred to "impermeable material to cover the entire body, ...natural rubber gloves, impermeable shoe coverings, ...goggles or face shields," etc., did not refer only to reentry within 24 hours after application of Group I pesticides for performance of tasks involving extensive foliage contact. It applied also to "<u>those involved in loading or applying pesticides</u>." The new standard specifically excludes these workers. They have become truly the forgotten persons in discussions of national pesticide safety. What an irony! There is every reason to believe that they need protection more than anyone else, and that this protection is not adequately provided by current label warnings and recommendations.

California, in 1973, saw dozens and dozens of poisonings of mixers, loaders, and applicators even when the label had been complied with. The pesticide industry may argue that their products, once in the environment, break down more slowly in California than anywhere else in the world, for reasons which have never been explained. But the industry cannot very well argue that the concentrate materials, in their original packaging, are more toxic in California than elsewhere. If a "swamper" in Florida inhales xm a xxxxxxxx wettable powder, or spills an emulsifiable concentrate on his cotton trousers, he will be affected in precisely the same way as his counterpart in Kern or Imperial County.

California workers (like Antonio Valadez, who very nearly died, even though all label requirements had been met) will, in the future, presumably be protected by regulations which go beyond label requirements. But that will leave the mixers, loaders, and applicators in every other state with no more protection than they have now -- which is not enough.

8. The sixth point in EPA's summary of the hearing record repeats the familiar incantation that the only reentry problems have arisen in "the arid areas of the western United States." A euphemism for California. The climate in the citrus-growing areas of Texas is essentially the same as that of citrus-growing areas in California, but EPA doesn't want to be disturbed by the merits of the case. The doctrine which is enunciated quite clearly at this point is one of states' rights: "specific restrictions (can) best be determined on a state-by-state basis thus avoiding the imposition

of inappropriate restrictions on growers and farm workers..." (emphasis added).

One despairs, again, of the intelligence and honor of political man. For the past forty years, this country has been working its way upward, slowly and painfully, from the doctrine of states' rights. To a romantic Jeffersonian, there is a certain appeal in the claim that the level of government which is "closest to the people" knows what is best for them. But, in actual practice, it has been proved to anyone with eyes to see that "states' rights" is a shibboleth used cynically and ruthlessly by those who want only to continue on a course of economic exploitation, political power, racial discrimination, or some other form of injustice which would not be tolerated at the national level.

EPA would turn back the calendar to 1932, would have us forget everything we have learned about social welfare programs, education, housing, civil rights, and every other form of social advance -- including health programs in general, and industrial safety in particular. The record shows, ~~without exception~~ a few honorable exceptions, that states are not the best judges of their own needs, and if left to their own devices those with the greatest needs will wallow indefinitely in the backwaters.

The influence of ~~XXXX~~ reactionary doctrine may be seen all too clearly in the quotation from EPA's summary underlined above. Not only is it considered "inappropriate" to "impose" the same restrictions on growers in backward areas as those in more advanced areas; it is assumed that farm workers in these

underdeveloped areas have interests identical to their employers, and that plantation workers would be hurt by "inappropriate restrictions" (meaning adequate reentry intervals) as much as plantation owners.

This is really no better than the claim, of more than a century ago, that slaveholders knew what was best for their slaves. One did not expect to hear such a claim made publicly in 1974. Especially, one did not expect to hear it coming from an Agency which claims to be concerned with human values.

9. The next section of the material appearing in the Federal Register of March 11, 1974, is entitled "Applicability and Enforcement of Existing Standards." Midway through this section, the following statement appears:

> ...PHI's as they presently appear on product labels will remain the basis for achieving acceptable tolerance residues on pesticide-treated food crops as well as the legally enforceable standard with respect to harvest entry times without protective clothing for those presently registered pesticides enumerated in Part 170.6.

I shall comment at length on Part 170.6 when I come to it. Suffice to say at this point that the foregoing statement is misleading, to say the least. In fully a quarter of all crop-compound combinations, PHI's have <u>not</u> been adopted as worker protection reentry periods for the thirteen enumerated pesticides. Sometimes the deviation is in one direction, sometimes another, sometimes "sideways," as I shall explain in a few moments. It is difficult to see how the consequences can be anything but chaos, not only in terms of worker protection, but in terms of tolerances and consumer protection.

10. In this section, EPA repeats the claim, already noted in comment #1, above, that "farmworker[1] re-entry times are contained on the labels of a number of presently registered pesticide products." The Agency then goes on to make the even more extraordinary statement that it "will continue to enforce (such) label requirements..."

When has EPA ever enforced a worker reentry time, or, for that matter, any other label requirement? Where are the enforcement personnel, even if the Agency had wished to exercise such a function?

11. The statement is made that "self-regulation is practiced by many growers. This may include restricting field worker entry from 12-24 hours following treatment with the more toxic pesticides."

What in Heaven's name is this intended to mean? That growers can be depended upon to police themselves out of the goodness of their own hearts? That is an even regressive doctrine than states' rights.

And is "12-24 hours following treatment with the more toxic pesticides" considered to be an adequate waiting period? That is an even more breath-taking assumption than contained in Section 170.6 which assigns at least a few of the "more toxic pesticides" post-application intervals of 48 hours.

12. The next section is entitled "Establishment of Additional

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1 The Agency uses this incorrect form throughout. One wonders if the persons who prepared this document would like their job titles to be run together in an equivalent manner: e.g., "governmentbureaucrat."

Standards." We learn, here, for the first time, that "EPA is sponsoring a number of research projects from which the first new data is (sic) expected to be available in early 1975 and there will be continuous review of these standards thereafter." It is nice to hear that the Agency may in time take some hard data into account in evaluating its standards, but several questions come to mind:

a. Why not take into account the data which are already in hand?

b. What is the nature of the research projects which EPA is "sponsoring?" If they are as badly conceived as those by Geo. Ware, et al., which the Agency seems to have considered worthy of $2,000,000 support, the prospect for meaningful results is dim.

c. When, if ever, is EPA going to come to grips with the need for guidelines which <u>all</u> reentry-related research will be expected to meet?

d. Why should such research be "sponsored" by taxpayers, when it is the responsibility of the manufacturer to prove, as a precondition of registration, that his product is safe when used as directed?

e. Why is it expected that "new data" will not become available until 1975? All the relevant data from a reentry study conducted in, say, June 1974 will be available within a matter of a few days. All that one needs to know from a properly designed study is that the group cholinesterase mean has not declined significantly. In order to protect participants from possible over-exposure, this information should be available within 24 hours. Even allowing a reasonable length of time for statistical analysis, there is

no good reason why the results of reentry studies now on the drawing board should not be incorporated into regulations before the end of the 1974 growing season.

Perhaps EPA is contemplating a more leisurely time frame because it is "sponsoring" another type of reentry study altogether: one in which participants are deliberately subjected to progressive cholinesterase decline over a period of time, and the rate of loss is equated against the decay rate of the compound involved. Such a type of study required much more care in planning; a different type of participants; elaborate medical precautions; and very time-consuming analyses of both cholinesterase and pesticide residues.

The public is entitled to know if this is how EPA intends to spend public funds. Studies of the foregoing type are certain to raise thorny ethical questions. And they are not really addressed directly to the needs of the moment. They are not reentry studies, as such, but studies of more fundamental chemical and physiological processes. Perhaps, ultimately, reentry intervals might be inferred from the results, but what is needed -- and needed as soon as possible -- is not inference, but a positive demonstration that under conditions of maximum allowable dosage, minimum allowable dilution, etc., a given compound on a given crop after a given number of days does not produce statistically significant cholinesterase inhibition in a cohort of workers.

13. "...with the exception of certain situations xin California, no...cases have been reported among workers who remained out of...treated fields for forty-eight hours or more." Even if we accept the validity of existing reporting systems -- which, of course, we should not -- this statement is transparently false. The Task Group report now circulating contains many cases of illness, and one death, among persons entering treated premises forty-eight hours or more after application. All these cases came from the literature which is as readily available to EPA as it was to the Task Group. Another demonstration that whoever framed these regulations simply didn't want to be bothered by facts.

14. "...the responsible State agencies are encouraged to establish such additional restrictions as warranted by available data." The example which EPA itself has set will scarcely inspire the States to respond to this "encouragement." Why should they search for data, or pay any attention to that which is already at hand, when EPA has not done so? Why should they adopt a stance of serious safety-consciousness when EPA has not done so? The whole pious appeal to "more restrictive State standards" is nothing more than a cop-out, an abdication of responsibility which by law resides at the Federal level. The message will not be lost on the States which are most in need of strengthened regulations. They will perceive that if EPA can shirk its responsibilities with impunity, so can they. And they will. To believe that Mississippi is going to voluntarily protect its sharecroppers

and field hands with "additional restrictions" is to believe in the Easter bunny and the tooth fairy.

15. "To promote understanding of the proposed farmworker protection standards for agricultural pesticides," a "graphic display is provided." This graphic display is so utterly incomprehensible it seems almost to have been designed to obfuscate the proposed reentry regulations.

16. Part 170.2(a). "Pesticide" is defined to include new materials under experimental use permits. The inclusion is commendable, but will not result in any added worker safety unless the persons who set the terms of experimental use permits are a great deal more scrupulous than the persons who set the standards for compounds already registered. The great danger is that persons in other arms of the Office of Pesticide Programs will take their cue from these new standards -- will accept, for example, the preposterous assumption that any and every compound becomes safe after 48 hours.

The 1973 experimental use label for Torak called for a 3 day waiting period for all crop-activities except harvesting, where the PHI was 35 days. That in itself was irresponsible enough, since we know that many cultural activities in grapes involve almost as much foliar contact as picking. We know, too, that under certain circumstances a waiting period of considerably more than 35 days produced significant cholinesterase depression. But will that deter the EPA personnel who pass on experimental use labels in the

future? Will they come under the reigning assumption that California is unique in all the world? (Perhaps our farm workers are drawn from some peculiar weakling stock!) Will they assume, as their colleagues evidently do, that an organophosphate is innocent until proven guilty of gross poisonings? Will they allow the Toraks of the future a 48 hourx post-application time -- or perhaps even 12 hours -- irrespective of persistence and toxicity? Why shouldn't they? Why should a maggin of safety be required of new compounds when it is not required of Systox, Phosdrin, etc.?

17. The definitions of "post application time," "pre-harvest time," and "harvest entry time," in Part 170.2(b),(c) and (d), strike me as hopelessly confused and confusing. I consider myself a reasonable intelligent and literate person: as much so as your average grower, foreman, or agricultural pest control worker. If I have trouble understanding EPA's concepts -- and their relationship to the older concept of "Pre-Harvest Interval" -- then I venture to guess that persons in the field, actually working with these toxic materials, xx will have no less trouble.

If the new terminology is to be retained at all, perhaps the only way to make it meaningful is to reduce it to a series of concrete examples. E.g, parathion on leaf lettuce is on EPA's "restricted list", so it has a"post-application time"of 45 hours. This means a worker cannot enter the field for any purpose without "protective clothing as defined." Following the expiration of that 48 hours, there is a "pre-harvest time," which is the difference between the"post-application time" and the "harvest entry

time." Since EPA defines the "harvest entry time" as 7 days, by a simple subtraction it may be ascertained that the "pre-harvest time" is 5 days. This means that during those 5 days, a worker may enter the treated field without special precautions for periods up to half an hour per day -- or for longer periods if his activities do not entail foliar contact. He should wear protective clothing, as defined, if he works for more than half anhour at a task involving foliar contact. But the expiration of the "harvest entry time" -- i.e., seven days after the application of the parathion -- does not mean that the lettuce can now be harvested. The Pre-Harvest Interval for this compound on this crop is 14-21 days, depending on the dose rate. During the 7-14 days between the end of the "harvest entry time" and the true Pre-Harvest Interval, workers may enter the premises for cultivating, transplanting, etc., but not for harvesting. Is that clear?

Perhaps, in the interests of charity, we should use a simpler example. Let us take the case of Delnav, which is not on the "restricted list." Let us assume it is applied at the maximum allowable rate of 12.5 pounds AIA on ~~Texas grapefruit~~ Texas grapefruit. EPA requires no Pre-Harvest Interval for purposes of achieving the consumer-protection tolerance of 2.8 ppm. Up to now, workers could legally have picked immediately after spraying. Under the new regulations, they still could, but during the first 12 hours after application they would have to wear protective clothing, as defined. After those 12 hours, there are no restrictions at all, either for purposes

of consumer or worker protection.[1] If the grapefruit are grown in Arizona or California, instead of ~~xxixx~~ Texas, there is still no consumer-protection interval, but there is a worker-protection interval of 30 days. If a grower wants to have his grapefruit picked the day after treatment with Delnav, in order to meet a favorable market condition, say, he may do so, but under California regulations he would have to put his workers in respirators and all the other equipment specified on the label for applicators; he would have to arrange for medical supervision, laundering of clothing, etc., etc. Clear?

Perhaps, on second thought, it would be better to go to a whole new terminology. Or, even better, a whole new set of concepts.

18. A "farm worker" is defined as "any person...engaged in agricultural hand labor in the field...after ground (other than insertion), aerial or other type of application of any pesticide." As noted earlier, of course, this excludes applicators, mixers, loaders, flaggers, and the like. It also excludes all those who may enter the premises later for the performance of other than "hand labor." For example, it would exclude the operators of the equipment which shakes nut trees. Some of us believe that these persons may be more at risk than hand harvest workers.

The definition also excludes anyone working in a field where there has been soil treatment, no matter what the compound, how heavy the treatment, or

1 Studies at the UC Riverside Citrus Experiment Station found an average of 4.0 ppm of Delnav on oranges 46 days after it had been applied at a rate of 5 pounds AIA. How EPA expects growers to meet the tolerance of 2.8 ppm with a PHI of 0 days, and how it expects to protect consumers with such a PHI, passes all understanding. But that is not the subject of this memo.

how recent. This exclusion rests on another assumption which merits more scrutiny than it has ever received. DiSyston is an extremely toxic material (oral LD_{50}, 2.6; dermal, 20) which is also persistent for six to eight weeks. Because it is used almost exclusively in soil treatments, the assumption is made that it poses no problem. It does not appear on EPA's "restricted list". But when it is applied around broccoli, cabbage, cauliflower, lettuce, who can be sure it poses no hazard to the workers who have intimate contact with the soil, while thinning and weeding? And who has proof that there is no respiratory hazard when heavy amounts of dust are stirred up in the course of harvest activities?

19. Part 170.2(e): "The term 'farm worker'...also includes any child under the age of 12 who might be in the field at any time for any reason." This is a very interesting concept -- the first we have encountered which might be said to incline in a "liberal," or safety-conscious direction. But then questions begin to come to mind. For a standard which is so concerned with "practicality" at every other turn, it is strange that these questions were apparently shrugged off here. Assume, for example, that the parents of an 11-year-old boy and a 12-year-old girl are thinning apples in Washington State, during the "pre-harvest time" for parathion. The children sleep in the car, or pass the early morning hours in some other way. At about 10:00, they take their parents a thermos of coffee. According to the proposed regulation, the 11-year-old would have to wear protective clothing for this

purpose; the 12-year-old would not. Who is to provide this protective clothing? Who is to say that an 11-year-old boy needs it, while a 12-year-old girl does not? Where is protective clothing to fit a small child to be found (particularly "fingerless gloves covering the back and front of hands and wrists")?

Isn't the very mention of children "under the age of 12" in the context of an Occupational Safety and Health Standard likely to create the impression that child labor in agriculture is acceptable? Everyone knows that children under the age of 12 very often work for wages in agriculture -- but it is nevertheless illegal. Dressing those children in "protective clothing" will not make it any more legal. (Or, for that matter, any more safe.)

Thus, in the end, one concludes that the inclusion of children under the EPA standard is not so "liberal" as it may at first blush have appeared. It would be wiser to omit any such reference. Or, if there is some compelling reason why children must be mentioned, they should be kept out of treated fields altogether, with none of this nonsense about protective garments for toddlers.

20. Which brings us to the definition of "protective clothing," in Part 170.2(g). Through the build-up elsewhere in the standard, one had expected that this was an important new concept. One is dumbfounded to learn that it means practically nothing more than the clothing most field laborers already routinely wear. Farm workers almost always wear a "hat with a brim," to keep the sun off their faces and the backs of their necks.

They almost always wear a "long sleeved shirt," particularly in tree crops, grapes, and other high-risk crops, to keep their arms from being scratched by twigs and spurs. They always wear "long legged trousers" (including women). In nearly 20 years of observation, I have never seen a field laborer working in a bathing suit or Bermuda shorts. They always wear socks and shoes "to cover both feet." In all my years, I have yet to see a farm worker with one shoe off and one shoe on.

All that is new in this standard is the truly bizarre concept of "fingerless gloves covering the back and front of hands and wrists." Whoever conceived this must have been a member of the Burning Tree Golf and Country Club. Gloves of roughly this description are often worn by golfers to protect the palm while leaving the fingers free to grip the shaft of the golfclub.

But farm laborers do not play golf. Where are they to get such gloves? And, if they found them, or created them by snipping the fingers off regular gloves, what good would they possibly do? I grow weary of repeating (in OSHA testimony, the Task Group report, etc.) that Maloach has proved conclusively that if gloves permit any ~~xxxxxxx~~ residue to reach the palm, thereafter they do more harm than good. Could anything be better calculated to let residues reach the palm than gloves <u>without fingers</u>? Such official ignorance would be uproarious were it not so dangerous.

Making every effort to be fair, we must recognize that there is one additional element in EPA's conception of "protective clothing." The hat,

shirt, trousers, socks, and fingerless gloves are supposed to be "clean." But this term is completely undefined. And there is no indication who is to pay for the costs of cleanliness. Reading a bit between the lines, it appears to be the responsibility of the worker himself.

> No owner or lessee of any field, or any other person shall permit any worker not wearing protective clothing as defined, to enter any part of a field...(etc.)

The responsibility of the employer seems to be limited to inspecting workers, and ordering them home if they are not properly attired, or if their attire is not sufficiently "clean," whatever that may mean. The concept is so ludicrous it bears no further comment.

21. At least one crucial concept is missing altogether from Part 170.2 of the standard, devoted to definitions. No attempt is made to define the person ultimately responsible for making sure the warning signs are posted, reentry intervals are observed, etc. The language quoted above refers only to the "owner or lessee of any field, or any other person." This is so vague as to be meaningless. The "owner or lessee" is often hundreds of miles away. Is he nonetheless responsible? Is it his resident manager? A producers cooperative to which he may have turned over his crop? The agricultural chemical firm which provided the ~~xxxxxx~~ spray materials and the recommendations for their use? The firm which did the actual spraying? The farm labor contractor who provided the workers? By adroitly passing the buck to one another, these and other functionaries who may become involved

could delay enforcement for years -- even assuming EPA had a massive legal staff to untangle the complex socio-economic snarls, which of course it does not.

If this, or any regulation like it, is to be effective, it must state at the very outset, without equivocation, "the buck stops here" -- and put the responsibility squarely on that person to see that the contractors, subcontractors, advisors, foremen, supervisors, and everyone else involved hews to the line.

22. "...pesticide shall not be applied in such a manner as to directly or through drift expose any worker or other person not in the specific field, or part thereof, except as for such persons knowingly involved in the pesticide application."

It will come as a surprise to many persons to learn that this is a new requirement: that during the 27 years of FIFRA, the Federal agency administering the Act has not heretofore explicitly forbidden the spraying of field laborers or other innocent bystanders with toxic materials. Part 170.3(a) must therefore be considered an advance, and it would perhaps be ungrateful to add that it is long overdue.

One anticipates certain difficulties in applying this section of the standard. What is exposure through "drift?" Presumably it is not limited to drift so heavy that it may be seen by the eye or felt on the skin. But where will EPA draw the line? Measurable amounts of residue can often be

recovered far from the application site. What is an acceptable level as it drifts through an open window onto a baby's crib, or into a hospital room? If EPA sets the level low, it will, in effect, be prohibiting much of the spraying in the fringes of rural towns. If it sets the acceptable level high, it will bring its new concept into disrepute. On what basis will the line of demarcation be set? Who will do the residue analysis or other means of enforcement?

Part 170.3(a) is a commendable beginning, but in its present form raises more questions than it settles.

23. Part 170.3(d): "Where a field is treated with more than one pesticide, entry into the field shall be prohibited until expiration of the longest of the applicable harvest entry times."

One is obliged, again, to read between the lines. From the use of the word "is," rather than "has been," one infers that reference here is to simultaneous, rather than sequential, application of two or more pesticides.

In California, we have wrestled for nearly four years with the problem of potentiation as it relates to reentry intervals, and have still not satisfactorily solved the problem. If we had only known EPA's solution -- it is so simple! EPA denies that there is any such thing as potentiation, atleast as far as reentry times are concerned. It is known, for example, that ethion and Guthion potentiate one another, and Zolone potentiates both, by something on the order of a twofold magnitude. EPA's proposed

"harvest entry time" for ethion on grapes is 15 days; Zolone, 14 days; Guthion, 7 days. (Interesting, in itself, since the best available evidence dictates that the gradient should be just the opposite. Guthion is the most toxic and most persistent; ethion, the least.) If all three compounds were applied to grapes (which, indeed, was done in one reentry study), under EPA's regulations the "harvest entry time" would still be only 15 days. This despite the fact that toxicological data suggest the need for a doubling of the margin -- not to mention the directly pertinent reentry study which found highly significant cholinesterase loss even after a waiting period of 42 days.

24. Part 170.5: Warnings. Let no one think that, throughout this review, I have been looking only for things to criticize. I have been on the lookout for the good as well as the bad, and it is a pleasure to be able to say that Part 170.5 strikes me as better than almost anything else I have seen on the subject of warning notices. Perhaps the best way to demonstrate its excellence is to compare it with what has been, up to this time, the most advanced thinking on the subject: namely, the section on Warnings in California's regulations of January 7, 1974.

a. California's regulations permit the option of "permanent posting," which is open to serious criticism. EPA does not countenance this option.

b. The California regulation ~~xxxxxxxxxxxxxxxxx~~ permits oral warnings, rather than the posting of warning signs, for all situations in

which the reentry interval is less than 3 days. EPA requires written warnings in every situation where there is an established worker protection reentry time, including at least ten which are less than 3 days.

c. EPA requires that warning signs be posted in advance of application. California's regulation is curiously worded: "These signs shall not be posted unless a pesticide application...is scheduled within the next 24 hours." This is quite different from saying that the signs shall be posted if an application is scheduled...

d. The California regulation applies only "when an employee is likely to enter a field to be treated or which has been treated..." The EPA standard applies, in addition, to those who "are expected to be working in the vicinity" of the treated field.

e. Both California and EPA require oral warnings when there is reason to believe an employee is unable to read. But EPA goes on to require that the employer "make reasonable effort to ensure understanding of such warning." A wise qualification. A distinction should surely be made between a perfunctory warning, couched in technical gobbledygook, and one which is couched in the vernacular.

f. Both California and EPA require that warnings be given not only in English, but in such other language or languages as may be necessary to communicate with workers.

g. California's regulation does not say where warning signs are to be posted. The matter is "to be prescribed by the (local agricultural)

commissioner." EPA stipulates that signs shall be posted "both at the usual points of entrance to the field, and on bulletin boards at points where the workers usually assemble for instructions." (One hesitates to carp, but there are many fields with no "usual points of entrance," and even more at which there is no point where workers "usually assemble for instructions." Something should be added to deal with these contingencies.)

h. Both California and EPA standards require that warnings carry the words "Danger" and "Do Not Enter," in letters readable at a distance of 25 feet.

i. California requires that such signs carry, in addition, the ranch name, field number, name of the pesticide, date applied, and date that it is safe to reenter. EPA requires somewhat more useful information, including the name of the crop treated, the location and boundaries of the field or section of the field treated, and the date both "post-application" and "harvest entry" times expire.

j. EPA requires that "posted signs shall be maintained for the duration of the applicable entry time." California's regulation is slightly more explicit: "...signs shall be of such durability and construction that they will remain clearly legible for the duration of the safety interval."

k. EPA requires that signs "be removed immediately" when they no longer apply. California gives the farm operator 3 days to do so.

* * * * *

On balance, EPA's standards are substantially more demanding than

those of California. If taken literally, they will apply not only to the 13 materials on EPA's "restricted list," but all other pesticides as well -- including those with "post-application" times of only 12 hours. The practical difficulties for growers, and the administrative problems for EPA, seem enormous. It is difficult to comprehend why the Agency was so deferential to industry's complaints of "impracticability" in every other area, but so tough-minded when it came to this one.

25. Part 170.6. This is the "restricted list" to which we have referred before. The term is ours, not EPA's, and derives from the fact these 13 compounds are given "post-application times" of 48 hours, rather than 12 hours, and are given specific "harvest entry times", whereas other compounds are not.

A host of questions arise, the first and most obvious of which is: why were these 13 compounds picked out for special attention?

a. Why was endrin included, alone among the chlorinated hydrocarbons? It is nowhere near as widely used as aldrin and dieldrin, and is only a little more toxic. All three fall within Toxicity Category I. But since the organochlorines act upon the organism in such a different way from the OP's, require such different types of detection, therapy, etc., it seems merely to confuse the issue to combine the two in the same safety standard. Or, if they are to be combined, then all the more hazardous OC's should be included, not just one. It really looks as though some nameless clerk in EPA put in

endrin, not realizing it was a chlorinated hydrocarbon, and no one else caught the mistake.

b. Why was Galecron (Fundal) included? It is not particularly toxic (oral LD_{50}, 127-352; dermal, 3000). It is used very little on high-risk crops, and when it is used on peaches, apples, etc., it is used almost exclusively on nonbearing stock, as a dormant spray, or after harvest. Was it, perhaps, implicated in an "episode," somewhere, sometime? If that is EPA's rationale, it is a dubious one, which places altogether too much reliance on its PASS system.

c. Why was Bidrin included? Because of its comparatively high toxicity (oral, 15-22; dermal, 225)? Because it happened to be mentioned once in a PASS report? These do not seem compelling arguments, compared to the fact it is used scarcely at all on crops involving substantial worker contact with foliage (a total of 44 pounds in California in 1972, none at all in the first three quarters of 1973).

d. Why were all carbamates excluded? Their action, and appropriate precautionary strategies, are certainly more similar to those of the OP's than endrin. If EPA is as concerned with toxicity as it seems to be, note the following acute oral LD_{50} values:

Furadan, 11.0 mg/kg.

Lannate, 17.0 mg/kg.

Temik, 0.93 mg/kg.

And if EPA is as concerned with illness reports as it seems to be, how can it fail to be aware of Lannate's involvement in many worker

poisonings in California last year?

Is EPA perhaps under the illusion that carbamates, as a class, are so short-lived that reentry periods are unnecessary? Pre-harvest intervals (which are set by EPA itself) suggest otherwise. PHI's for Furadan range from 7 to 28 days; for Lannate, up to 40 days; and for Temik, 90 days.

e. The most toxic of all organophosphates are excluded:

TEPP (oral, 1.05; dermal, 2.4)
Thimet (oral, 1.1; dermal, 2.5)
Di-Syston (oral, 2.3; dermal, 6.0)
Phosdrin (oral, 3.7; dermal, 4.2)

Again, one can only conjecture as to the reasons. It cannot be because these compounds have been free from "problems," for they have not. Is it because they are thought to be used for soil treatment only? TEPP and Phosdrin are, of course, used for foliar treatments exclusively. Thimet is used largely in granular form for ~~xxxxxxx~~ soil treatment, but is registered for use as a "foliar spray" on both cotton and lettuce. EPA should be aware of these registrations, since it granted them. Di-Syston is also available as a liquid concentrate which may be applied as a "sidedressing" after the emergence of such leafy crops as broccoli, brussels sprouts, cabbage, cauliflower, corn, and tomatoes. As a matter of fact, the label recommends treatment of lettuce "at thinning time." There is no way a sidedressing at such a time can be kept from producing residues on the foliage, and no way a lettuce thinner can be kept from contacting that residue if there is no entry restriction.

Is EPA perhaps under the impression that the most highly toxic OP's

dissipate as soon as they are applied? To be sure, Phosdrin is comparatively short-lived, and TEPP even more so. But they do not disappear immediately, as is well recognized in EPA's own Pre-Harvest Intervals which are 3 days for TEPP, and up to 7 days for Phosdrin. It should be remembered that the absence of these materials from the EPA worker safety "restricted list" means that one can enter treated premises without any protections whatsoever just twelve hours after application; and that one can enter in less than twelve hours so long as one is dressed in ordinary cotton work clothing. Is this a sufficient margin of safety for materials as toxic as these? California authorities think not. They were given uniform reentry intervals of four days, "just in case," even though they have not to date been involved in any controlled reentry studies -- and, owing to their extreme hazard, perhaps never will be.

As for Di-Syston and Thimet, there can be little doubt they are persistent as well as extremely toxic. Pre-Harvest Intervals for Thimet range from a minimum of 28 days to as much as 90 days for potatoes. PHI's for Di-Syston begin at 28 days and go to 100 days for sweet corn.

f. The omission of certain other highly toxic organophosphates is even more mysterious. Phosphamidon, for example, has an oral toxicity of 23.5 and a dermal of 107, making it considerably more toxic in both respects than ethion, Metasystox-R, and a number of other compounds which are on the "restricted list." Phosphamidon is used entirely in liquid formulations, for foliar application. Its persistence is reflected in PHI's of 15 days on citrus, and 30 days on apples. It has been included in every other attempt to formulate worker protection reentry periods: the California

Department of Agriculture; Federal Task Group; CSHA; EPA, itself, on July 31, 1973. Why has Phosphamidon now been dropped?

The question is even more urgent with respect to Delnav, since it is even more toxic (oral, 23; dermal, 63); far more persistent; and has been strongly implicated in harvest worker poisonings. In its treatment by Federal agencies, Delnav has led a curiously charmed existence, which bears more scrutiny than it has yet received from any watchdogs of the public weal. To begin with, it was granted a Pre-harvest Interval of zero days on citrus. Singularly curious, since (as remarked in Comment 17, above) it is manifestly impossible to achieve the tolerance of 2.8 ppm without an extended PHI. Indeed, this characteristic of Delnav is implicitly recognized in other tolerances and PHI's. It is assumed to take 30 days to meet the allowable level of 2.1 ppm on grapes; 7 days to reach 4.9 ppm on apples; etc. On apricots, cherries, peaches, and plums Delnav cannot legally be applied after the fruit begins to form: i.e., at least 90 days before harvest. Why zero days for citrus? Can it be because the manufacturer intended to direct its sales promotion primarily in this direction, and prevailed upon the Pesticide Registration Division to approve a label compatible with this objective? Whatever the case, 77% of all Delnav seems to be used on citrus. Perhaps it is only coincidence. Perhaps it is only coincidence, too, that Delnav was permitted a tolerance of 2.8 ppm on citrus, while Phosphamidon, which is less toxic was assigned a tolerance of 0.75; Diazinon, which is far less toxic than either, was also assigned 0.75 ppm; etc.

In reviewing the way Delnav has been treated by the Federal agencies, many other questions arise. In OSHA's initial worker reentry standards, published in the Federal Register on May 1, 1973, Delnav was given a reentry interval of 2 days on all crops, which one would have thought was more than lenient enough. In its next version, however, published on June 29, OSHA dropped Delnav from coverage altogether.

In its first experiment with worker reentry intervals, EPA gave Delnav 3 days across the board. Now, it has again been dropped entirely. Why? What is the strange power which Hercules Inc. appears to exercise over the regulatory agencies? Has it anything to do with the fact that Hercules "lobbies" more consistently and aggressively with the regulatory agencies than any other manufacturer (with the possible exception of Rhodia)? Is this the basis on which decisions about pesticide safety should be made?

g. Monitor and Torak are highly toxic and persistent, but unrestricted.

h. Finally, there are a number of organophosphates in Toxicity Category II (acute oral LD_{50} between 50 and 500 mg/kg), covered in previous attempts at formulating meaningful worker reentry standards, all of which have now been dropped by EPA: Diazinon, Cygon, Dibrom, Imidan, Dylox, etc. To lump them with the materials in Categories III and IV, as though they were as innocuous as malathion or Tedion, is defiant of common sense and an open invitation to future problems.

In any health and safety standard worthy of the name, there must be a consistent, defensible relationship between degree or risk and degree of

of protection. EPA has made no apparent effort to adhere to this cardinal principle. Its proposed farm worker standards are shot through and through with mysterious, arbitrary, capricious inclusions and exclusions. There is no discernible gradient between hazard and protection. The Agency has thereby laid itself wide open to attack from both sides, and both sides will be justified in their attacks. Manufacturers of compounds which appear on the "restricted list" may legitimately complain of the double standard which restricts them while leaving their competitors untouched. Persons concerned for farm worker health and safety may legitimately complain of a standard which regulates highly toxic materials laxly at best, and leaves many of them without any regulation whatever.

There are probably those within the Agency who take the fuzzy-minded view that "if we're attacked from both sides, we must be right." In a question of scientific ~~xxxxxx~~ fact, the truth does not lie in the middle of the road. If the National Health Law Program announced that the sky is blue, and NACA rounded up a battery of bought witnesses to testify that it is yellow, would EPA than proclaim the Solomon-like decision that it is green?

Questions of worker safety are almost as clearcut, ultimately, as the color of the sky. The only proper place for EPA, or for any other agency which purports to establish and enforce safety regulations, is not half-way between conditions which are safe and those which are unsafe, but four-square on the side of conditions which are safe.

26. Which brings us, at last, to Part 170.100: "Specific Harvest Entry Times After Application for Purposes of Harvest." The more I study this long list of "numbers," and try to relate it to the remainder of the standard, the more confusing it all becomes.

a. Part 170.3(c) states that workers not wearing "protective clothing" shall not be permitted to enter any part of a field treated with any pesticide listed in Part 170.100 during any pre-harvest time for any purpose involving more than half an hour of foliar contact." ~~But~~ This sounds as though the numbers in Part 170.100 are intended to protect thinners, weeders, and others engaged in significant-contact activities in precisely the way harvest workers are protected. But other sections of the standard seem equally clearly to belie this intent. For example, Part 170.2(d) states ~~unxquxabxx~~ unequivocably that the numbers pursuant to the "restricted list" apply to a "farm worker, not wearing protective clothing, (entering) the field to harvest any crop." And, of course, the title of Part 170.100, cited above, refers not once, but twice, to harvesting in the course of just ten words.

There are two possibilities. (1) Allusions to "harvest entry" and "pre-harvest time," etc., may be designed to disarm the agri-industrial complex by making it appear that this is nothing more than a codification of Pre-Harvest Intervals the industry has been leaving with peacefully for years. Under this interpretation, coverage of thinners, pruners, cultivators, and others is being accomplished through a very subtle and circumspect side door.

(2) The other possibility is that Part 170.3(c) is inadvertently broad, and that what is really meant is that no harvest worker shall enter during any pre-harvest time "if such entry involves contact with any foliage for more than one-half hour."

Everything I know about the history of this standard, and about the way that EPA minds work, leads me to believe the second of these interpretations is the correct one. I know, for example, that EPA is obsessed with the significance of reported poisonings. If there have not been any great number of poisonings reported among thinners, pruners, strippers, weeders, etc., EPA assumes that residues pose no problems to them. I really believe that the 48-hour rule is the only protection intended for them.

b. If "harvest entry times" are intended to cover only harvest workers, as upon reflection I now believe they are, one may wonder why EPA doesn't simply state (as it did in its July 31, 1973, standard) that henceforth Pre-Harvest Intervals shall be enforceable for purposes of worker safety, rather than merely suggestions for the purposes of achieving tolerances. The answer, I think, is that someone got to EPA and said, in so many words, "Look here, we all know that tolerances and PHI's have a big margin of safety cranked into them -- far more than worker protection requires. There may be many situations in which it is legitimate to harvest and then let the crop sit in the fields or in a warehouse for a long period before it is marketed -- raisin production, for example."

EPA evidently found this argument persuasive -- ignoring, as

usual, the best available evidence. All but one of the reentry studies conducted to date has revealed that PHI's were too short for effective worker protection, not too long.

I have gone through all the "harvest entry times" in Part 170.100, and compared them with Pre-Harvest Intervals. I found that they differed in 120 cases. (See Attachment I.) In 94 of these 120 cases, the "harvest entry times" afforded less protection than PHI's; in 20 cases, more; in 6 cases, a strict comparison between relative protection could not be made.

To be sure, there were another 250 cases in which PHI's and "harvest entry times" were identical. In summary, then, the two concepts are equivalent in about two-thirds of all crop-compound combinations; they diverge in about one-third of all cases; and, when there is a divergence, about 80% of the time it is in the direction of giving less protection to harvest workers than they used to get under PHI's.

c. It is impossible to understand why EPA included, in its list of numbers designed to protect harvest workers from foliage residues, a large number of crops which never involve contact with foliage, in pre-harvest, harvest, or post-harvest activities. These include barley, oats, rye, wheat, pasture grass, and vetch. It is particularly instructive to ignore these and to concentrate upon those crops where there is known to be extensive contact with treated plant surfaces, and those compounds which are known to be comparatively toxic and persistent. In these terms, we see, for example, that the new "harvest entry times" afford less protection than PHI's for

methyl parathion, EPN, and Guthion on nectarines; Systox and ethion on apples; Guthion, Systox, and Trithion on citrus; Guthion and EPN on peaches; ethion and EPN on cotton; methyl parathion, ethion and EPN on cherries; ethyl parathion and EPN on olives; Systox and ethion on plums and prunes; methyl and ethyl parathion and Metasystox R on brussels sprouts and cabbage and cauliflower; ethion and EPN on tomatoes; and Guthion, ethion, and Metasystox R on grapes. Some of the discrepancies in these high-exposure crops are quite striking. For example, tomatoes have a Pre-Harvest Interval of 28 days when ethion is applied at a rate of 1.2 lbs. AIA; they have a flat 2-day "harvest entry time" for ethion, no matter what the dose rate. In other words, the 48-hour post-application rule also serves, in this case, as the full re-entry requirement.

For another example, the shortest PHI for parathion on leaf lettuce is 14 days; for higher dose rates, the PHI is 21 days. The "harvest entry time," for all dose rates, is 7 days.

For still another example, the PHI for Guthion on grapes ranges up to 28 days, depending on dosage. Guthion on grapes has no "harvest entry time" at all -- meaning that workers are protected by nothing beyond the 48-hour post-application period.

d. In more cases than not (56 of 94), "harvest entry times" are shorter than PHI's because of EPA's abandonment of a principle which has successfully guided the Pesticide Registration Division for years. This principle might be called "let the punishment fit the crime" -- i.e., the higher the dosage rate, the longer the waiting period should be. Although this logical concept has not been incorporated in all PHI's, it has

been followed in many. It has not survived at all in worker-protection intervals, which are set in every case at an arbitrary level regardless of dose rate. As indicated, in the majority of cases (60%), the arbitrariness operates against the interests of worker safety. On existing labels, there is as much as an eightfold difference in the dosage rates of parathion on the same crop, with gradients in PHI's to take these differences into account. In 19 of 24 cases, however, parathion "harvest entry times" are set at the lowest PHI; in 3 cases, they represent a compromise; and in only one case (tobacco) do they match the longest PHI.

e. The relative handful of cases in which "harvest entry times" equal the longest PHI in a gradient, and the even smaller number of cases in which they exceed the longest PHI, are probably a mixed blessing from the standpoint of worker safety. At the present time, for example, a citrus grower is offered a sliding scale, from 14 to 30 days, for Trithion on grapes, depending on dosage; under the proposed new standard, the reentry time is set at a flat 30 days. Under existing label recommendations, there is a gradation between 3 and 14 days for Guthion on peppers, depending on number of applications during the growing season. Under the proposed new standard, there is a flat entry time of 14 days, regardless of number of applications.

Faced with such a situation, a grower is likely to say to himself, "If I apply at the low rate, but have to wait as long as I would for a high rate, I'm apt to get a re-infestation by harvest time. I'd better go the high rate, just to be safe." The interests of worker safety will not be

well served by higher application rates, any more than by short reentry times. Worker safety would be best served by EPA recognition of the same principle it has always recognized in connection with consumer-protection PHI's: namely, that greater dangers should be accompanied by greater protection.

f. Abandonment of all the established principles portends nothing but disaster for everybody concerned: farm workers, growers, the administrative agencies (EPA and FDA), and perhaps the general public. Picture, for example, the citrus grower who has applied Systox to his crop. It has long carried a Pre-Harvest Interval of 21 days. If this citrus grower has operated in California for the past few years, he has no doubt been perplexed by the fact that the California worker safety interval for Systox on citrus is only 5 days. But let us assume that he has figured out he really shouldn't send his workers in to pick after 5 days, no matter what California regulations say, or he will run the risk of having his crop "red-tagged" for being over tolerance.

Comes now a Federal regulation, promulgated by the very same agency which formerly set the PHI at 21 days, saying that the "harvest entry time" for Systox on oranges is just 48 hours. In all likelihood, the grower is not a lawyer. He doesn't have access to the March 11, 1974, issue of the Federal Register. He doesn't know that "Independent of the standards herein proposed, the Agency will continue to enforce current label requirements..." He assumes that EPA has simply changed its mind as to the waiting period for picking oranges after application of Systox. He has his

oranges picked after two days, at which time they have 8.9 ppm of Systox rather than the allowable of 0.75. Maybe he will get away with it for a season or two, since State and Federal agencies sample such a small percentage of produce for tolerance-testing purposes. But if he's caught, he stands to lose a year's income. And maybe his workers will be lucky, and escape from their exposure to Systox residues with nothing more than vague symptoms, which they do not mention to their jefe for fear of losing their jobs. But perhaps they won't be so lucky, either...

The growers of many other crops will be similarly misled as to when it is and is not considered by EPA to be safe to harvest their crops. In the confusion, they are in serious danger of economic losses, while workers will be in serious danger of losses of health and perhaps even of life. A grape grower, studying the new schedule carefully, may notice that it appears to encourage the use of Guthion. This compound, applied to grapes at the rate of 1.5 lbs. AIA, has in the past called for a PHI of 28 days. The new schedule calls for only 2 days. Why should he not pick in a hurry, to take advantage of the high prices early in the season? The same holds true of grape growers who use parathion or ethion; apricot growers who use EPN; nectarine growers who use methyl parathion; peach growers who use guthion; apple growers who use ethion; etc., etc., etc.

The irony is that industry will be opposing the new standard for all the wrong reasons. They should be opposing it, not because it is too restrictive (for it is not), but because it departs so capriciously and pointlessly from the PHI's to which the industry has grown accustomed. The

result will not only fail utterly to protect farm workers, but will drag down a good consumer-protection program in the general debacle. If there is anything the pesticide and agricultural industries do not need it is a major public scandal, with lettuce, tomatoes, grapes, peaches, etc., reaching the tables of America with excessive residues of deadly poisons akin to the "nerve gas" developed by Hitler's chemists, etc., etc.

* * * * *

To summarize these overly-long comments:

1. EPA's latest proposals, on balance, represent the latest retrograde step in an unhappy history of Federal attempts to enter the field of farm worker pesticide safety. In Attachment II, I have summarized the heart of these several attempts: namely, basic worker protection intervals. At issue, essentially, is not the protection of harvest workers; none of the Federal proposals have dared to tamper with the Miller Amendment and its PHI's. The crucial new element in the four sets of proposals during the past year is the protection of non-harvest workers. As may be seen in Attachment II, OSHA began, on May 1, 1973, with reentry intervals which would have given these workers some measure of protection from 21 compounds on five high-risk crops. These non-harvest worker intervals ranged from a minimum of 2 days up to 14 days, with an average of about 5 days. On June 29, 1973, under pressure from industry, OSHA published a set of much weaker intervals. Eight compounds, including Delnav, Zolone, and ethion, were

dropped from coverage altogether. Essentially all the 5 day intervals were arbitrarily cut to 3 days.

The following month, July, 1973, EPA published its first version of farm worker reentry intervals. They were based primarily on toxicity, without regard to persistence. Thus, both TEPP and Delnav were assigned reentry intervals of 3 days, because they both fall in toxicity Category I, although the former probably dissipates entirely in less than 3 days, while the latter probably does not dissipate in 300 days. In general, EPA's July 31, 1974, proposals bore a close resemblance to OSHA's first version, of May 1. With only one exception, however, EPA's proposals for worker reentry periods were shorter than EPA's own Pre-Harvest Intervals. (The one exception was Phosdrin.)

EPA's Second proposals, of March 11, 1973, represent a retreat so broad that it might fairly be called a rout. Certain "problem" materials, which formerly had reentry intervals of 5, 7, 10, and even 14 days under certain circumstances, now have a basic interval of 2 days. Those which formerly had an interval of 2 or 3 days now are assigned ½ day, across the board.

Thus, I entitle Attachment II a "Devolution of Federal Pesticide Safety Standards" -- devolution meaning "retrograde evolution," "descent," or "degeneration."

2. This devolution was not occasioned by any "new evidence," EPA's claims to the contrary notwithstanding. There is, in fact, a considerable body of evidence bearing directly on the question of worker reentry. It

has been ignored, without exception, in the setting of these new standards. The standards could and should be challenged by proponents of occupational health and safety on this, among many other grounds.

3. It was improper for EPA to have given any weight to the "volume of testimony" submitted by unqualified, self-serving witnesses. The setting of safety standards is a scientific undertaking, not a popularity contest.

4. It was improper for EPA to have given any weight to claims of "interference with accepted agricultural practices." The sole legal responsibility of this agency, under FIFRA, is to protect the environment "including living man." There is not one word anywhere in the law about protecting profits. (What is more, it was improper to have taken at their face value claims of interference with production. California experience proves there is no incompatibility between effective pest control and effective worker safety.)

5. It was improper for EPA to have used poisoning reports as the primary basis for evaluating potential hazards.

6. It was improper for EPA to have embraced the contention that there are no problems, outside of California, "among workers who remained out of... treated fields for forty-eight hours or more."

7. It was improper for EPA to have embraced the doctrine of "states' rights."

8. It was improper for EPA to have embraced the notion of "self-regulation" by the agricultural industry.

9. It was improper for EPA to have embraced the idea that ordinary cotton work clothing provides any meaningful protection against pesticide residues. My research in Fresno County in 1973 found that nearly as much paraoxon penetrates such clothing as remains on the surface (1.43 $\mu g/in^2$ vs. 1.60 $\mu g/in^2$). Preliminary findings from this research were in the hearing record available to EPA.

10. It was improper for EPA to have ignored the entire concept of potentiation, when data in its own files show that OP's in combination may potentiate one another sixteenfold or more.

11. It was improper for EPA to have issued a "restricted list" not based on chemical class, toxicity, persistance, or any other relevant factor.

12. It was improper for EPA to have assumed that it is safe to enter 48 hours after the application of such compounds as parathion, Guthion, Trithion, Azodrin, Zolone, and Systox, for all purposes other than harvesting, regardless of dosage rate, crop, etc.

13. It was improper for EPA to have assumed that it is safe to enter 12 hours after the application of such compounds as Delnav, Torak, Monitor, Di-Syston, Thimet, Phosphamidon, regardless of crop-activity, dosage rate, etc.

14. It was improper for EPA to have abandoned, in worker safety standards, all the principles which have undergirded a successful consumer safety program since 1957. Twelve of these principles were identified in testimony I gave in Sacramento on September 11, 1973, on behalf of myself and yourself. Although the hearing was conducted by EPA, not a word we said has survived in its so-called worker protection standards.

Perhaps it is timely to remind EPA of those principles, once more. Perhaps the ACS meeting on April 3 will be an appropriate place to do so.

* * * * *

If the present EPA standard is as shoddily, and even dangerously, conceived as I believe it to be, what should EPA be doing instead? I recommend the following:

1. Reentry research should be required as a precondition of all new registrations and all re-registrations, under Section 3(c)(2) of FIFRA as amended. Manufacturers should be responsible for providing the data, although in actual practice the work will probably be performed by independent research laboratories in most cases. Studies should meet certain criteria which are by now/relatively well-established even in the absence of the so-called Silby Report: the physiological parameter to be studied; how it should be studied, and how often; protection of human subjects; etc., etc.

2. Applicants and registrants should be given one complete growing season in which to gather the necessary data. During this period, EPA should be working on a comprehensive farm worker safety standard. An adequate standard must cover not only "field laborers," but mixers, loaders, and sprayers -- who are often the very same individuals who later enter the premises for picking fruit, etc. An adequate standard must also give due recognition to all the viable protective strategies, including medical supervision, washing facilities, safer formulations, etc., which are omitted from the present EPA standard.

When I say that EPA should spend this year doing its homework on a

comprehensive standard, I do not mean it quite literally. It is now embarrassingly evident that EPA lacks in-house competence in matters of human health, industrial safety, and the like. The framing of a national pesticide safety standard should therefore be turned over to a Task Force of persons with demonstrated expertise in these disciplines. This should not be a politically "balanced" group, such as has reduced the Milby Committee to virtual impotence. It should be limited to persons who have actually succeeded in formulating effective regulations governing occupational exposures to hazardous materials. Ideally, the members should have experience in regulating pesticides, and even more ideally, pesticides in agriculture. We in California sometimes assume that only we have any such experience, but that is not true. New York State and a few others have well-conceived pesticide safety programs. And a representative Task Group could be fleshed out/experts in the basic principles of occupational health, with whose experience has been in protecting workers from exposure to other types of toxic substances. A basic way of looking at the problem is the most important quality -- and the quality most conspicuously missing in the EPA hierarchy.

3. Meanwhile, what should be done by way of an interim standard -- if anything?

a. If there is to be an interim standard, it must not include the present references to "protective clothing."

b. If there is to be an interim standard, it must not include any of the present numbers, whether they be "post-application times," "pre-harvest times," or "harvest entry times."

c. If there is to be an interim standard, it might properly include much of the present section on Warning Notices -- but only if such notices can be coupled with meaningful reentry intervals.

d. The closest thing to "meaningful reentry intervals" currently available on a nationwide basis for most compounds and most crops consists of PHI's. As you noted in your testimony at Phoenix, on August 2, 1973, these need "a few obvious modifications." E.g., Delnav on citrus has no PHI at the present time. Guthion on grapes, when applied at .75 lbs AIA, has no PHI. Ethion on oranges and grapefruit, when applied at 7.5 lbs AIA, has no PHI. Such incomprehensible oversights in the tolerance-setting process can be corrected quite readily. (As it happens, there are good data bearing on all the foregoing cases, on which sound reentry periods could be based.)

e. Regulations in California, New York, and other states with comparatively advanced programs, should, of course, be permitted to stand.

f. About the only thing in EPA's present standard which, so far as I am concerned, is beyond question is the prohibition of exposing innocent bystanders to direct spraying or spray drift. There is something to be said for promulgating an interim standard limited to this concept alone. It requires no supporting "evidence," beyond a modicum of human common sense and decency.

It would be interesting indeed to see what NACA did with respect to such a standard. If it let it stand without challenge, something useful would have been gained: the right of EPA to regulate in the area of worker safety. If even such a minimal standard were challenged by NACA, something

useful would still have been gained. In the battle for public opinion, it would have been demonstrated, once and for all, that the agri-industrial complex cares not a fig for human common sense and decency.

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Good luck at the ACS convention and press conference. Sorry I've written at such inordinate length and with such fervor. I only hope I have thrown out a few ideas which you can use. No authorship credits need be given!